set, including employing a second quantizing step independent of the first quantizing step, wherein the second data set when combined with the first data set is suitable for reproducing substantially the entire image at a second higher quality level, store the first compressed image data set in the image storage device, and store the second compressed image data set in the image storage device if space is available.

27.   (Once Amended)   The system of claim 26 wherein the processing unit is configured to perform JPEG compression to generate the first compressed image data set and the second compressed image data set.

32.   (Once Amended)   The system of claim 29, wherein each first compressed image data set in the secondary storage area has associated with it an image quality metric and the processing unit is configured to release space in the secondary storage area of the image storage device in lowest image quality first order.

REMARKS

The Applicants wish to thank the Examiner for granting the telephonic interview conducted on September 12, 2002.

PENDING CLAIMS

Claims 10-32 are pending. Of these, claims 10, 18, and 26 are independent. Claims 15-17, 25, 27, and 32 were objected to due to minor informalities. Claims 14 and 22 were rejected under 35 U.S.C. §112, second paragraph. Claims 10-11 and 18-19 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Saito (U.S. Pat. No. 5,838,834) in view of Ligtenberg (U.S. Pat. No. 5,333,212). Claims

12-17 and 20-32 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Saito in view of Ligtenberg in further view of Yamagata (U.S. Pat. No. 6,261,106).

Claim Objections

Claims 15-17, 25, 27, and 32 were objected to due to minor informalities. These claims have been amended to correct the minor informalities listed in the Office Action. Accordingly, the Applicant respectfully requests withdrawal of these objections.

Rejection under 35 U.S.C. § 112

Claims 14 and 22 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite. More particularly, the claims were rejected for lack of antecedent basis for "the image storage device" recited in each of the claims. Claims 14 and 22 have been amended to correct the lack of antecedent basis. Accordingly, the Applicant respectfully requests withdrawal of this rejection.

Rejection under 35 U.S.C. § 103(a) over Saito in view of Ligtenberg

Claims 10-11 and 18-19 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Saito in view of Ligtenberg. This rejection is respectfully traversed.

Claims 10 and 18 recite, *inter alia*, generating from the raw image, including employing a first quantizing step, a first compressed image data set suitable for reproducing substantially the entire image at a first quality level. Claims 10 and 18 further recite, generating from the raw image, including employing a second

quantizing step independent of the first quantizing step, a second compressed image data set which when combined with the first compressed image data set reproduces substantially the entire image at a second, higher quality level. Claim 26 recites similar features.

As indicated in the Applicant's previous response, Saito fails to teach or suggest a second quantizing step <u>independent</u> of the first quantizing step. Saito discloses first and second embodiments (*See* Saito, col. 3, line 56-col. 6, line 24) and a sixth embodiment (*See* Saito, col. 9, line 39-col. 11, line 15) which include multistage quantization. In a first stage of the multistage quantization, DCT coefficients are quantized to obtain quantization components. In a second stage, residual data A, i.e., quantization errors from the first stage, are quantized, and in a third stage, residual data B, i.e., quantization errors from the second stage, are quantized. (*See* Saito, col. 4, lines 23-43). Neither the second stage nor the third stage is independent from the first stage, because the second and third stages are dependent on data (i.e., residual data) generated from the first stage quantization.

The rejection indicates that, among other features, the claimed second quantizing step is taught by Saito in col. 6, line 37-col. 9, line 38. Saito in col. 6, line 37-col. 9, line 38 discloses fourth and fifth embodiments, each of which employs only one quantizing step. In the fourth embodiment, illustrated in figure 4, the DCT coefficients are quantized once by the quantizer 104. The quantized coefficients are then arranged from low to high frequencies using zigzag scanning after quantization. The arranged coefficients are then encoded. The fifth embodiment is similar to the fourth embodiment, except a band Huffman coder is used in place of a plurality of Huffman coders. Therefore, these embodiments also do not teach or suggest the claimed second independent quantizing step. In addition, Ligtenberg does not teach or suggest the claimed second independent quantizing step.

In the Examiner interview, the Examiner indicated that the fourth and fifth embodiments employ progressive coding which may quantize and code an image in 8x8 pixel blocks, whereby each quantized and encoded block may be suitable for reproducing only a portion of the image. As agreed upon in the interview, the independent claims have been amended to include a first data set suitable for reproducing <u>substantially the entire image</u> at a first quality level, and a second data set which when combined with the first data set reproduces <u>substantially the entire image</u> at a second higher quality level. Neither Saito or Ligtenberg teach or suggest these features. Accordingly, claims 10-32 are believed to be allowable.

<u>Rejection under 35 U.S.C. § 103(a) over Saito in view of Ligtenberg in further view of Yamagata</u>

Claims 12-17 and 20-32 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Saito in view of Ligtenberg in further view of Yamagata. This rejection is respectfully traversed. Furthermore, these claims are believed to be allowable for at least the reasons described above with respect to the rejection over Saito in view of Ligtenberg.

<u>CONCLUSION</u>

As all of the outstanding rejections have been traversed and all of the claims are believed to be in condition for allowance, the Applicant respectfully requests issuance of a Notice of Allowability.
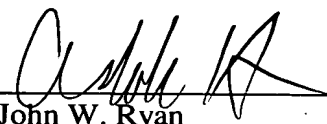
If the undersigned attorney can assist in any matters regarding examination of this application, the Examiner is encouraged to call at the number listed below.

Respectfully submitted,

WILMER CUTLER & PICKERING

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

10.   A method for processing images in a digital camera comprising the steps of:

inputting a raw image;

generating from the raw image, including employing a first quantizing step, a first compressed image data set suitable for reproducing **substantially** the **entire** image at a first quality level; and

generating from the raw image, including employing a second quantizing step independent of the first quantizing step, a second compressed image data set which when combined with the first compressed image data set reproduces **substantially** the **entire** image at a second, higher quality level.

14.   The method of claim 10, wherein the **[image storage device]** **digital camera** includes primary and secondary storage areas, the method further comprising:

releasing space in the secondary storage area of the image storage device if insufficient space is available in the primary storage area of the image storage device to store the first compressed image data set.

15.   The method of claim **[15]** **14**, wherein the step of releasing space in the secondary storage area of the image storage device releases space in a first in first out order.

16. The method of claim [15] 14, wherein the step of releasing space in the secondary storage area of the image storage device releases space in a last in first out order.

17. The method of claim [15] 14, wherein each **first** compressed image data set stored in the secondary storage area has associated with it an image quality metric and the step of releasing space in the secondary storage area of the image storage device releases space in lowest image quality first order.

18. A system of processing images in a digital camera comprising:

    means for inputting a raw image;

    means for generating from the raw image, including employing a first quantizing step, a first compressed image data set suitable for reproducing **substantially** the **entire** image at a first quality level; and

    means for generating from the raw image, including employing a second quantizing step independent of the first quantizing step, a second compressed image data set which when combined with the first compressed image data set reproduces **substantially** the **entire** image at a second, higher quality level.

22. The system of claim 18, wherein the [**image storage device**] **digital camera** includes primary and secondary storage areas, the system further comprising:

    means for releasing space in the secondary storage area of the image storage device if insufficient space is available in the primary storage area of the image storage device to store the first compressed image data set.

25. The system of claim 22, wherein each **first** compressed image data set in the secondary storage area has associated with it an image quality metric and the means for releasing space in the secondary storage area of the image storage device releases space in lowest image quality first order.

26. A system for processing images in a digital camera comprising:

an image storage device; and

a processing unit configured to transfer raw image data from an input device, generate a first compressed image data set from the raw image, including employing a first quantizing step, **wherein the first data set is suitable for reproducing substantially the entire image at a first quality level,** and generate a second compressed image data set, including employing a second quantizing step independent of the first quantizing step, **wherein the second data set when combined with the first data set is suitable for reproducing substantially the entire image at a second higher quality level,** store the first compressed image data set in the image storage device, and store the second compressed image data set in the image storage device if space is available.

27. The system of claim 26 wherein the [processor] **processing** unit is configured to perform JPEG compression to generate the first compressed image data set and the second compressed image data set.

32. The system of claim 29, wherein each **first** compressed image data set in the secondary storage area has associated with it an image quality metric and the

processing unit is configured to release space in the secondary storage area of the

image storage device in lowest image quality first order.